

*THE EFFECTS OF A VITAMIN SUPPLEMENT ON
THE PICA OF A CHILD WITH
SEVERE MENTAL RETARDATION*

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The effects of a common multiple vitamin on the pica of a child with severe mental retardation and anemia were evaluated. A BAB design revealed that pica was decreased by the vitamin. The results suggest that pica can be effectively treated by implementation of a simple nutritional or biological intervention. Further research investigating the generality of this finding and the effects of combining biological and behavioral interventions are discussed.

DESCRIPTORS: pica, biological interventions, outpatient settings

Pica, the ingestion of nonfood substances, is a dangerous behavior that can result in choking, poisoning, infections, and intestinal obstructions. Pica has been shown to be sensitive to a variety of environmental (e.g., Piazza et al., 1998) and biological (e.g., Moore & Sears, 1994) variables. The most common biological explanation of pica describes it as resulting from nutritional deficiencies (Moore & Sears, 1994). However, the preponderance of articles arguing that pica was successfully treated by the administration of a specific nutrient or mineral consist of case studies that lack objective measurement and an experimental design. Only two studies in this literature experimentally demonstrated a relation between pica and nutrition. Bugle and Rubin (1993) showed a decrease in coprophagia in 3 developmentally disabled individuals following the use of a supplemental diet, and Lofts, Schroeder, and Maler (1990) demonstrated a functional relation between zinc levels and pica in a woman with profound mental retardation.

The present study attempts to further investigate the relation between pica and nu-

tritional and biological variables by systematically assessing the effects of a commonly available multiple vitamin on the pica of a child with severe mental retardation and anemia.

METHOD

Participant and Setting

The participant was a 9-year 5-month-old girl who had been diagnosed with severe mental retardation, iron deficiency, and anemia. No other diagnoses, vitamin or mineral deficiencies, or behavior problems were identified. At the time of the study, Dana lived at home with her parents and attended public school. Her pica consisted of ingesting cloth fragments, string, and synthetic fibers. Dana's parents reported that her pica began at the age of 3 years. However, they could not accurately identify the frequency of Dana's pica because she reportedly engaged in the behavior only when adults were distracted or not present. In addition, the family and school personnel had attempted to remove Dana's preferred nonfood items from the home and classroom. Nevertheless, Dana's parents reported that over the past 6 years they had observed daily attempts to engage in pica. Approximately 2 years prior to

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the investigation, Dana required surgery for an intestinal blockage as a result of pica.

At the time of the initial assessment, Dana's parents reported that there had been no instances of pica for the previous 3 weeks. The parents indicated that this represented the longest period of time without pica in over 6 years. This decrease in the frequency of pica coincided with the administration of a multivitamin, Polyvisol®, which is an over-the-counter liquid vitamin commonly used by infants and preschool children. Dana's parents administered the recommended dosage (1 ml) of the vitamin each morning. At the time of the administration of the vitamin, Dana was also taking iron supplements prescribed by her physician for the treatment of anemia.

Response Measurement and Data Collection

Pica was defined as the placement of a nonfood substance on or past the lips. All sessions were conducted in a treatment room (2.7 m by 2.9 m) with a one-way observation window. The room was baited with preferred nonfood items (as identified by Dana's parents) and also contained two chairs, a couch, a small table, and various toys.

Because Dana's parents did not want her to engage in repeated pica, each session was terminated immediately upon the occurrence of pica. Sessions were terminated at 10 min if no pica occurred. During all sessions, trained observers used laptop computers to record the time to the onset of pica from behind the one-way mirror. A second observer collected data on 33% of the sessions. Interobserver agreement was calculated by dividing the shortest latency to pica by the longer latency for each session, and multiplying by 100%. Mean interobserver agreement for the onset of pica was 99% (range, 97% to 100%).

Procedure and Design

Observations were conducted under two conditions: alone and others present. In the

others present condition, a clinician or parent was seated in the room, but faced away from Dana and was occupied in an activity such as reading or writing. In the alone condition, Dana was alone in the room. In each condition, age-appropriate toys and preferred nonfood items were available in the room.

A BAB design was used because the nutritional intervention (administration of the vitamin) was in effect during the initial assessment. Treatment data were collected while Dana was taking both the iron and vitamin supplements. Baseline sessions were conducted following the discontinuation of the vitamin. During these observations, only the vitamin was discontinued, use of the iron supplement continued across the entire investigation. Following the baseline observations, Dana was again given the vitamin. Her primary physician approved the systematic removal and reintroduction of the vitamin and exposure to the above-mentioned nonfood items.

RESULTS AND DISCUSSION

Figure 1 shows that Dana's latency to pica increased during times when she was taking the vitamin in both alone and others present conditions. The results of this investigation support the hypothesis that, in some cases, pica can be effectively and efficiently treated by implementation of a medical intervention. Most of the current literature that has reported a relation between biological factors and pica consists of an initial comprehensive blood analysis that attempts to identify a specific mineral or nutritional deficiency (e.g., iron, zinc, calcium, etc.) hypothesized to affect pica. This analysis is typically followed by the introduction of the deficient nutrient or mineral, which is then followed by additional blood analysis to determine if the deficiency has been resolved. The present investigation contributes to this literature by

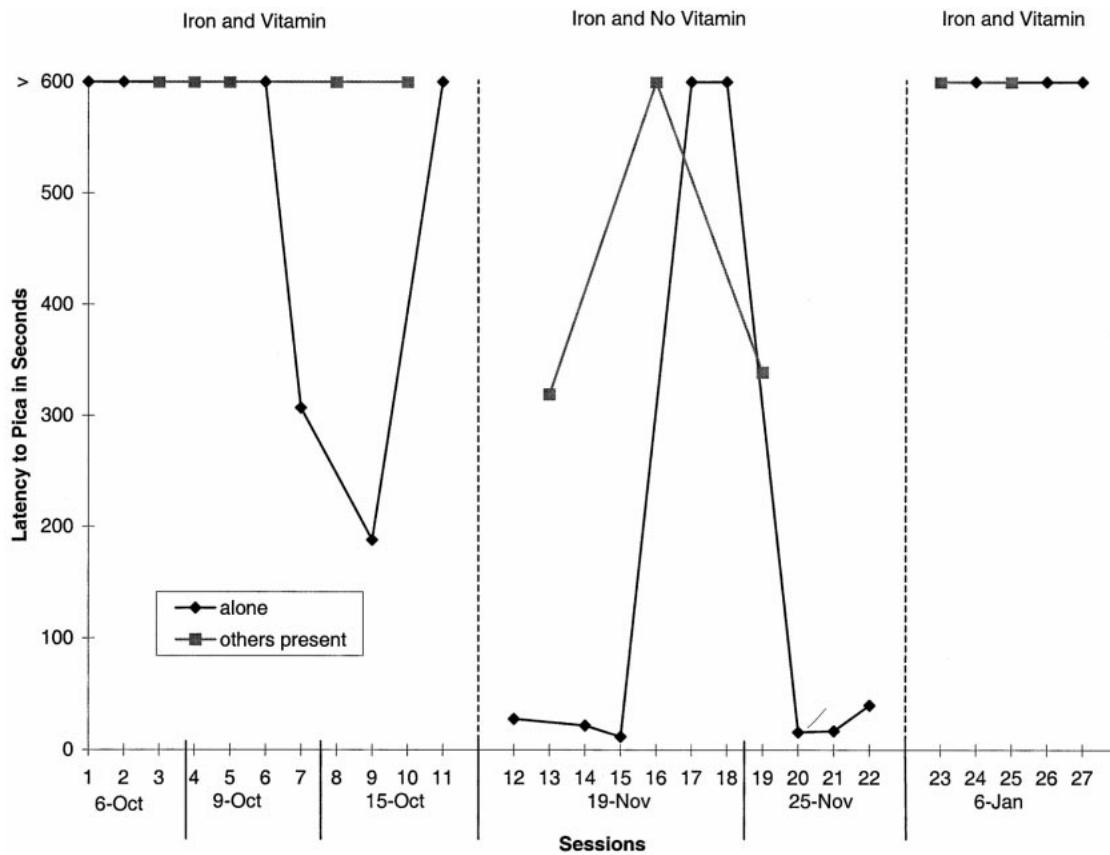


Figure 1. Latency to pica during alone and others present conditions.

demonstrating that a commonly used multivitamin can also decrease pica. The practical implications are that intrusive and costly blood analyses could potentially be replaced with a daily multiple vitamin. Because the iron supplement remained constant throughout the investigation, it is not clear if the vitamins' effects were affected by the ongoing iron supplement. The vitamins may have decreased pica because they directly provided a deficient mineral or because they affected the absorption of iron or some other deficient nutrient (Snowdon, 1977).

In addition to the practical implications of successfully addressing pica by simply administering a vitamin or other mineral, it is also likely that manipulation of these antecedent variables may affect the potency of

behavioral interventions. Proponents of the biological explanation view pica as an adaptive ingestive behavior that substitutes non-food items for a nutritional deficiency (Snowdon, 1977). In behavioral terms, the nutritional deficiency is an establishing operation for pica that is altered by the substitute nutrient or mineral. Conceptualized in this way, behavior analysts may enhance the effectiveness of their interventions by manipulating these motivational factors in addition to the consequences of the behavior.

The results of this case study represent an initial step toward a comprehensive analysis of the role of biological events on pica. Future research should consider the use of rate measures of pica that establish a safe criterion for the termination of sessions (e.g., Piazza et al., 1998) and placebo conditions to

better establish the effects of over-the-counter vitamins on pica. Additional research is also needed to establish the generality of the present findings and to identify the variables that contribute to its effectiveness (e.g., presence of other syndromes, eating disorders, etc.).

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Received March 1, 2000

Final acceptance August 20, 2000

Action Editor, Craig H. Kennedy